

Title: What's the Point?

Brief Overview:

This unit introduces students to technology as a means of graphing linear equations on a graphing calculator and finding the point of intersection, inputting data into lists, creating scatter plots, finding lines of regression, and making conjectures about data.

Links to NCTM 2000 Standards:

- **Mathematics as Problem Solving, Reasoning and Proof, Communication, Connections, and Representation**

These five process standards are threads that integrate throughout the unit, although they may not be specifically addressed in the unit. They emphasize the need to help students develop the processes that are the major means for doing mathematics, thinking about mathematics, understanding mathematics, and communicating mathematics.

Students will use the TI-83 to solve simultaneous equations, and they will input and graph data. They will interpret and analyze graphs of linear functions and make conjectures about data. Students also will use correct mathematical language to describe results of solving simultaneous equations and interpreting data. Furthermore, they will recognize the relationship between algebraic representations and graphical representations. Last of all, students will be able to use real life situations and apply them to algebraic and graphical representations.

- **Patterns, Functions, and Algebra**

Students will solve simultaneous equations in two variables using the graphing method and the linear combination method.

Links to Maryland High School Mathematics Core Learning Units:

Functions and Algebra

- **1.1.1**

Students will recognize, describe, and extend patterns and functional relationships that are expressed numerically, algebraically, and geometrically.

- **1.1.2**

Students will represent patterns and functional relationships in a table, as a graph, and/or by mathematical expression.

- **1.1.3**

Students will add, subtract, multiply, and divide algebraic expressions. They will solve and describe if and where two straight lines intersect using numbers, symbols, and graphs.

Data Analysis and Probability**• 3.2.1**

Students will make informed decisions and predictions based upon the results of simulations and data from research.

• 3.2.2

Students will make predictions by finding and using a line of best fit by using a given curve of best fit.

• 3.2.3

Students will communicate the use and misuse of statistics.

Grade/Level:

Grades 8-12; Algebra I, Algebra II

Duration/Length:

Four to five class periods of 45 minutes each.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Graphing on the xy-coordinate plane
- Solving simultaneous equations in two variables by the graphing method and the linear combination method

Student Outcomes:

Students will:

- use the TI-83 to graph simultaneous equations in two variables and find the point of intersection.
- use the TI-83 to enter data into lists, generate a scatter plot of the data, find curves of regression and find the equations of the curves of regression.
- interpret intersection of lines of regression and make conjectures.

Materials/Resources/Printed Materials:

- TI-83 calculator
- TI-83 overhead projector
- Student Activities #1, #2, #3, and Student Assessment

Development/Procedures:

The teacher will use the TI-83 overhead projector to show students how to graph two equations in two variables and find the point of intersection on Activity #1.

The teacher will guide the students to input statistical data into lists on the TI-83 calculator and to generate a scatter plot of the data on Activity #2.

The teacher will guide the students to find lines of regression and their equations using the TI-83 calculator on Activity #3.

Students will find points of intersections, input data and generate scatter plots, and find lines of regression individually on each activity sheet.

Assessment:

There is one assessment at the end of Student Activity #3. Each question will be worth one point except for Part B #4 which will have a scoring rubric.

Extension/Follow Up:

Students will get the closing prices of two different stocks over a period of two weeks. They will create scatter plots and find the line of regression for each stock. They will make a conjecture on what stock they would like to purchase and why.

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Teacher Notes: “What’s the Point?”

Purpose: *Students will be introduced to technology by a means of:*

- graphing linear equations
- finding points of intersection
- inputting data lists
- creating scatter plots
- finding lines of regression
- making conjectures about data

Materials Needed:

- TI-83 Graphing Calculator
- TI-83 overhead projector
- Student Activities #1, #2, #3, and Student Assessment

Helpful Hints:

Activity #1

- Make sure that the plots are off and the y= formulas are cleared before entering equations.
- Remember to put parentheses around fractions.

Activity #2

- Students might prefer inputting data from Table A in L1 and L2 and data from Table B in L3 and L4. If they choose to do this, change the plot parameters for Table B to L3 and L4.

Activity #3

- Make sure that the different symbols are used for each plot, to differentiate between plots.
- Use the ZoomStat function to get the best picture of the Scatter Plot.
- Identify L3 and L4 when computing the line of regression for West Stock.

Assessment

The best window for seeing the point of intersection for the final graph is:

- Xmin = -6.8
- Xmax = 200
- Xscl = 25
- Ymin = 7
- Ymax = 12
- Yscl = 1

Name: _____

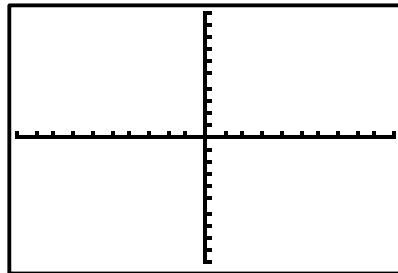
Date: _____

Student Activity #1 - Find the Intersection

- A. Solve the system of equations using the graphing method. Check using either linear combination or substitution.

$$-3x - 2y = 4$$

$$5x + 2y = 6$$



- B. Use a graphing calculator to solve the system of equations by finding the point of intersection.

Procedures to solve the system of equations on the TI-83

1. To graph the linear equations.
 - a. Convert the equations to slope intercept form.
 - b. Press **[Y=]**
 - c. Clear entries and turn off plots.
 - d. Input the slope-intercept forms into the calculator.
 - e. Press **[Zoom]** then **[6]** for ZStandard
 - f. Press **[Window]**, change y-min to -20 and y-max to 5.
 - g. Press **[Graph]**
2. To find the intersection.
 - a. Press **[2nd]** then **[Calc]**
 - b. Press **[5]** for intersect
 - c. Move cursor close to the intersection using the side arrow keys.
 - d. Press **[Enter]**, **[Enter]**, **[Enter]**.
3. What is the point of intersection?

- C. Work independently to solve this system of equations using the graphing calculator.

1. $x + y = 9$
 $2x - y = -3$

Answer = _____

2. $0.7x - 0.3y = 0.5$
 $-0.4x + 0.7y = 1.3$

Answer = _____

D. Work with a partner to solve using the graphing calculator.

John and Martha are going on vacation and need to rent a car for the week. The first rental company, Mavis, charges a flat rate of \$25 and an additional \$.15/mile. The second rental company, Shertz, charges a flat rate of \$35 and \$.05/mile.

1. Write out the equations in terms of cost per day.

$C(\text{Mavis}) =$

$C(\text{Shertz}) =$

2. After you enter your equations, change the window setting to the following:

```
WINDOW
Xmin=0
Xmax=200
Xsc1=5
Ymin=0
Ymax=200
Ysc1=50
Xres=1
```

3. At what distance will the costs be equal?

4. If John and Martha went to Virginia Beach 384 miles away for a seven-day vacation, then which company should they use? Justify your answer using complete sentences.

Name: _____

Date: _____

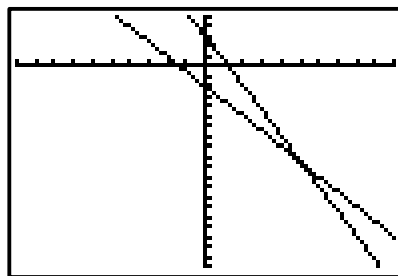
Student Activity #1 - Find the Intersection

Teacher Answer Key

- A. Solve the system of equations using the graphing method. Check using either linear combination or substitution.

$$-3x - 2y = 4$$

$$5x + 2y = 6$$



- B. Use a graphing calculator to solve the system of equations by finding the point of intersection.

Procedures to solve the system of equations on the TI-83

1. To graph the linear equations.
 - a. Convert the equations to slope intercept form.
 - b. Press [**Y=**]
 - c. Clear entries and turn off plots.
 - d. Input the slope-intercept forms into the calculator.
 - e. Press [**Zoom**] then [**6**] for ZStandard
 - f. Press [**Window**], change y-min to -20 and y-max to 5 .
 - g. Press [**Graph**]
2. To find the intersection.
 - a. Press [**2nd**] then [**Calc**]
 - b. Press [**5**] for intersect
 - c. Move cursor close to the intersection using the side arrow keys.
 - d. Press [**Enter**], [**Enter**], [**Enter**].
3. What is the point of intersection? (+5, -9.5)

C. Work independently to solve this system of equations using the graphing calculator.

$$\begin{aligned} 1. \quad x + y &= 9 \\ 2x - y &= -3 \end{aligned}$$

Answer = (2, 7)

$$\begin{aligned} 2. \quad 0.7x - 0.3y &= 0.5 \\ -0.4x + 0.7y &= 1.3 \end{aligned}$$

Answer = (2, 3)

D. Work with a partner to solve using the graphing calculator.

John and Martha are going on vacation and need to rent a car for the week. The first rental company, Mavis, charges a flat rate of \$25 and an additional \$.15/mile. The second rental company, Shertz, charges a flat rate of \$35 and \$.05/mile.

1. Write out the equations in terms of cost per day.

$$C(\text{Mavis}) = 25 + .15m$$

$$C(\text{Shertz}) = 35 + .05m$$

2. After you enter your equations, change the window setting to the following:

```
WINDOW
Xmin=0
Xmax=200
Xscl=5
Ymin=0
Ymax=200
Yscl=50
Xres=1
```

3. At what distance will the costs be equal?

The daily cost would be equal if they drove 100 miles per day. The daily cost at 100 miles, is \$40.

4. If John and Martha went to Virginia Beach 384 miles away for a seven-day vacation, then which company should they use? Justify your answer using complete sentences.

Exemplary answer: They should use Shertz rental company because they will be driving a total of 768 miles which is more than 100 miles per day. This company is less expensive than Mavis; therefore it is the better choice.

Name: _____

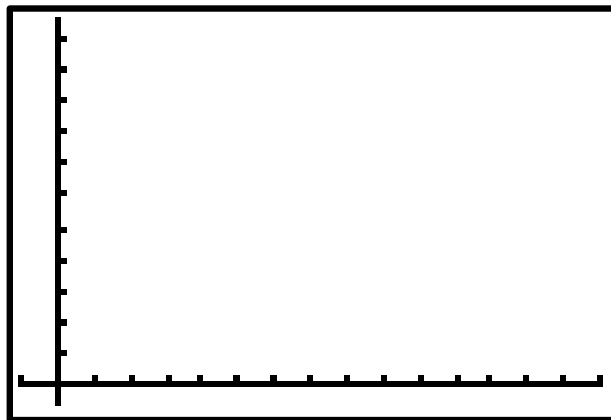
Date: _____

Student Activity #2 – Scatter Plots

- A. Each student in Mrs. Johnson’s class measured his/her height and weight. The results are listed below.

STUDENT	HEIGHT (in)	WEIGHT (lbs)
Mary	66	125
John	72	197
Joe	69	156
Sam	75	210
Susie	61	95
Pam	65	148
Kara	63	115
Bob	68	185
Sharon	66	141
Kyle	61	135
Nancy	71	150
Ed	78	211
Penny	60	98
Lisa	64.5	133
Lou	70	187

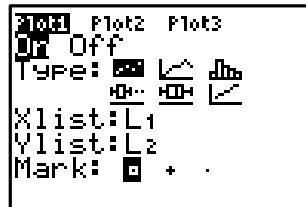
1. Individually, create a scatter plot using the grid below. Use a scale of 5 for the x-axis and a scale of 20 for the y-axis.



2. Is this a positive, negative, or zero correlation?
3. Teacher Led Activity: Together, use a graphing calculator to make a scatter plot. Use L1 for “height” and L2 for “weight.”

Procedure:

- a. Press [STAT], [EDIT], [ENTER].
- b. Input height in L1.
- c. Input weight in L2.
- d. Press [2^{nd}], [STAT PLOT], [1], [ENTER].
- e. Turn Scatter plot ON.
- f. Select scatter plot icon.
- g. Choose L1 and L2.
- h. Choose symbol.
(See diagram below for e-h.)
- i. Press [ZOOM], [9].



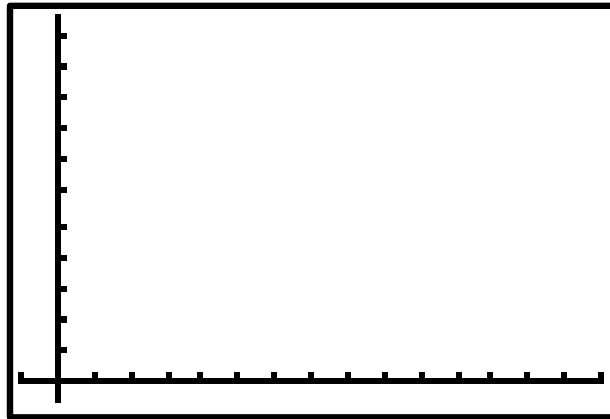
B. The table below shows the times at bat and the number of hits for players of a team over one season.

PLAYER	TIMES AT BAT	NUMBER OF HITS
John	350	125
Peter	319	100
David	100	20
Jose	159	50
Moses	400	141
Caleb	289	72
Carlos	319	72
Mel	250	60
Opie	273	73
Dean	178	21
Kevin	199	33
Abe	223	45
Moe	286	68
Bob	348	97
Don	183	21
Steve	213	30

1. Individually, use a graphing calculator to make a scatter plot. Use L1 for “times at bat” and L2 for “number of hits.” Use the diagram below to change the windows. Press [**WINDOWS**].

```
WINDOW
Xmin=100
Xmax=430
Xscl=20
Ymin=-.57
Ymax=160
Yscl=20
Xres=1
```

2. Copy the scatter plot on the grid below.



3. Is this a positive, negative, or zero correlation?
4. Explain the relationship between the data using a complete sentence.
5. Give an example of a negative correlation.

Name: _____

Date: _____

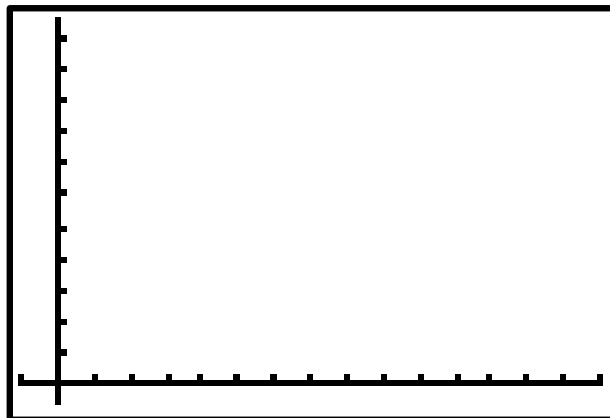
Student Lesson #2 – Scatter Plots

Teacher Answer Key

- A. Each student in Mrs. Johnson’s class measured his/her height and weight. The results are listed below.

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John	72	197
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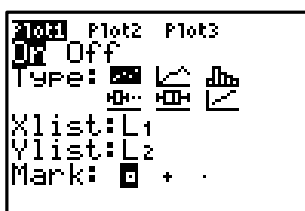
1. Individually, create a scatter plot using the grid below. Use a scale of 5 for the x-axis and a scale of 20 for the y-axis. (See Student’s Grid)



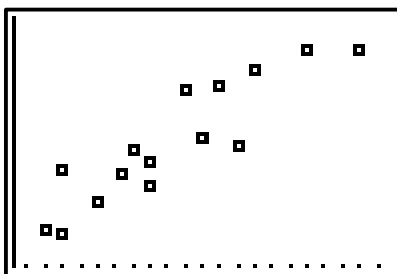
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3. Teacher Led Activity: Together, use a graphing calculator to make a scatter plot. Use L1 for “height” and L2 for “weight.”

Procedure:

- a. Press [STAT], [EDIT], [ENTER].
- b. Input height in L1.
- c. Input weight in L2.
- d. Press [2^{nd}], [STAT PLOT], [1], [ENTER].
- e. Turn Scatter plot ON.
- f. Select scatter plot icon.
- g. Choose L1 and L2.
- h. Choose symbol.
(See diagram below for e-h.)
- i. Press [ZOOM], [9].



Answer:



- B. The table below shows the times at bat and the number of hits for players of a team over one season.

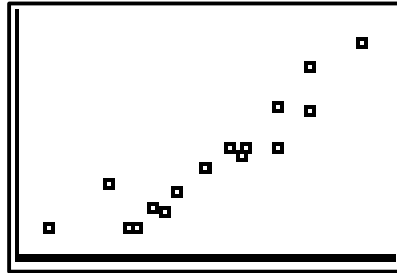
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Jose	159	50
Moses	400	141
Caleb	289	72
Carlos	319	72
Mel	250	60
Opie	273	73
Dean	178	21
Kevin	199	33
Abe	223	45
Moe	286	68
Bob	348	97
Don	183	21
Steve	213	30

1. Individually, use a graphing calculator to make a scatter plot. Use L1 for “times at bat” and L2 for “number of hits.” Use the diagram below to change the windows. Press [WINDOWS].

```
WINDOW
Xmin=100
Xmax=430
Xscl=20
Ymin=-.57
Ymax=160
Yscl=20
Xres=1■
```

2. Copy the scatter plot on the grid below.

Answer:



3. Is this a positive, negative, or zero correlation?
4. Explain the relationship between the data using a complete sentence.
- As the number of at bats increases the number of hits increases.
5. Give an example of a negative correlation.

(answer will vary)

Name_____

Date_____

Student Activity #3 – Trend Line and Predictions

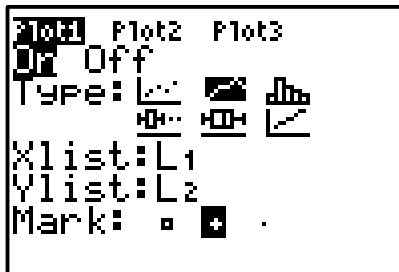
Problem: Joe Stockjockey wants to purchase some stock in Coolraps.Com. (symbol COOL) or West Coast Jams.Com.(symbol WEST). Your assignment is to make a scatter plot with the closing monthly stock prices in the table below and have the calculator graph the trend line using the LinReg(ax+b) function. Answer all the questions and decide which stock he should buy.

Part 1: COOL

Month	Jan. (1)	Feb. (2)	March (3)	April (4)	May (5)	Jun. (6)	July (7)	Aug. (8)	Sept. (9)	Oct. (10)	Nov. (11)	Dec. (12)
Closing Stock Price	14.5	15.25	14	14.75	15.75	16.25	17	16.5	17.5	17.25	17	18

Procedures:

- Input the number of the months under L1
- Input the closing monthly stock prices under L2
- Highlight everything then press **[ENTER]** (see diagram below)
- Make sure that Xlist is L1 and Ylist is L2.



- Press **[GRAPH]**
- Press **[ZOOM]** then **[9]** ZoomStat
 - What axes do L1 and L2 represent? _____
 - What does step F do? _____
- Press **[STAT]** (see diagram on the next page)


```

EDIT [MODE] TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7↓QuartReg

```

H. Press [**Right Arrow**] then [4] LinReg(ax+b) and [**ENTER**]

- 1) What does a=? _____ What does it tell us about the line? _____
- 2) What does b=? _____ What does it represent? _____

I. Press [Y=] [VARS] [5] Statistics

```

VARS Y-VARS
1:Window...
2:Zoom...
3:GDB...
4:Picture...
5:Statistics...
6:Table...
7:String...

```

J. Press [**Right Arrow**] twice, highlight EQ then press [1] or [**ENTER**] (see diagram below)

```

XV Σ [MODE] TEST PTS
1:RegEQ
2:a
3:b
4:c
5:d
6:e
7↓r

```

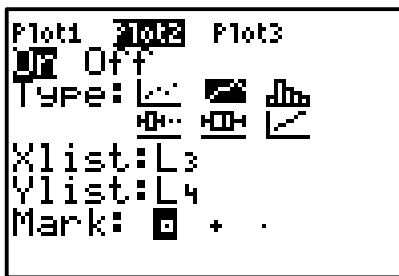
K. Press [**GRAPH**]

- 1) Based on the trend line, is the stock going up or down? _____
- 2) Predict the price of COOL in Feb. of the next year.
Press [2nd][TABLE] to find the value at X=14. _____

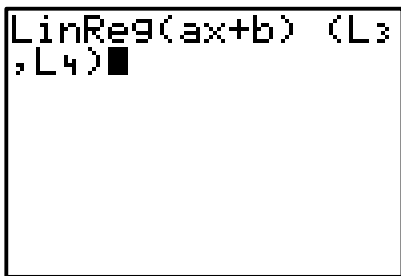
Part 2: WEST

Month	Jan. (1)	Feb. (2)	March (3)	April (4)	May (5)	Jun. (6)	July (7)	Aug. (8)	Sept. (9)	Oct. (10)	Nov. (11)	Dec. (12)
Closing Stock Price	20	19.25	18.75	19	18.25	17.75	18.25	17	16.75	16.25	16.5	16

- Input the number of the months under L3
- Input the closing monthly stock prices under L4
- Press **[2nd] [Y=]** Stat Plot **[ENTER]**
- Press **[2]** Plot 2
- Change Xlist to L3 and Ylist to L4
- Highlight everything (see diagram below)



- Press **[STAT]**
- Press **[Right Arrow]** highlight **CALC** then **[4]** LinReg(ax+b)
- Type in (L3,L4) **[ENTER]** (see diagram below)



Why do we do step I? _____

- Is WEST going up or down? _____
- Would you buy West? Why? _____

- Press **[GRAPH][ZOOM]STAT**.

K. Press [**Y=**]

L. Move your cursor to Y2.

M. Press [**VARs**] [**5**] Statistics

N. Press [**Right Arrow**] twice, highlight EQ then press [**1**] or [**ENTER**]

O. Press [**GRAPH**]

1) On what day will the price of COOL be equal to WEST? _____

2) Which stock should he buy? Why?

3) What will be the value of West in January of the next year? _____

Name_____

Date_____

Student Activity #3 – Trend Line and Predictions**Teacher Answer Key**

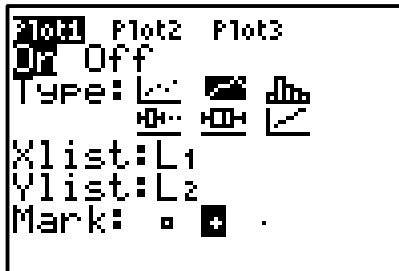
Problem: Joe Stockjockey wants to purchase some stock in Coolraps.Com (symbol COOL) or West Coast Jams.Com (symbol WEST). Your assignment is to make a scatter plot with the closing monthly stock prices in the table below and have the calculator graph the trend line using the LinReg(ax+b) function. Answer all the questions and decide which stock he should buy.

Part 1: COOL

Month	Jan. (1)	Feb. (2)	March (3)	April (4)	May (5)	Jun. (6)	July (7)	Aug. (8)	Sept. (9)	Oct. (10)	Nov. (11)	Dec. (12)
Closing Stock Price	14.5	15.25	14	14.75	15.75	16.25	17	16.5	17.5	17.25	17	18

Procedures:

- Input the number of the months under L1
- Input the closing monthly stock prices under L2
- Highlight everything then press **[ENTER]** (see diagram below)
- Make sure that Xlist is L1 and Ylist is L2.



- Press **[GRAPH]**
- Press **[ZOOM]** then **[9]** ZoomStat
 - What axes do L1 and L2 represent? L1 = months L2= closing stock price
 - What does step F do? makes the graph visible and changes the window
- Press **[STAT]** (see diagram on the next page)

```

EDIT [MODE] TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7:QuartReg

```

H. Press **[Right Arrow]** then **[4]** LinReg(ax+b) and **[ENTER]**

- 1) What does a=? -.3523 What does it tell us about the line? the slope
- 2) What does b=? 20.1 What does it represent? The y-intercept which is also the approximate stock price on the last day of December.

I. Press **[Y=]** **[VARs]** **[5]** Statistics

```

VARs Y-VARS
1:Window...
2:Zoom...
3:GDB...
4:Picture...
5:Statistics...
6:Table...
7:String...

```

J. Press **[Right Arrow]** twice, highlight EQ then press **[1]** or **[ENTER]** (see diagram below)

```

XY Σ [EQ] TEST PTS
1:RegEQ
2:a
3:b
4:c
5:d
6:e
7:r

```

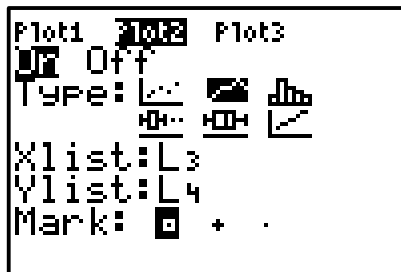
K. Press **[GRAPH]**

- 1) Based on the trend line, is the stock going up or down? up
- 2) Predict the price of COOL in Feb. of the next year.
Press **[2nd]****[TABLE]** to find the value at X=14. approx. \$19.60

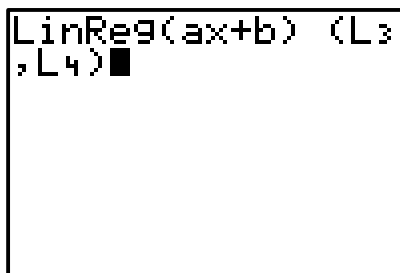
Part 2: WEST

Month	Jan. (1)	Feb. (2)	March (3)	April (4)	May (5)	Jun. (6)	July (7)	Aug. (8)	Sept. (9)	Oct. (10)	Nov. (11)	Dec. (12)
Closing Stock Price	20	19.25	18.75	19	18.25	17.75	18.25	17	16.75	16.25	16.5	16

- Input the number of the months under L3
- Input the closing monthly stock prices under L4
- Press **[2nd] [Y=]** Stat Plot **[ENTER]**
- Press **[2]** Plot 2
- Change Xlist to L3 and Ylist to L4
- Highlight everything (see diagram below)



- Press **[STAT]**
- Press **[Right Arrow]** highlight **[CALC]** then **[4]** LinReg(ax+b)
- Type in (L3,L4) **[ENTER]** (see diagram below)



Why do we do step I? to make the calculator find the line of regression for the second stock WEST

- Is WEST going up or down? down
- Would you buy West? Why? no, because it is going down

- Press **[GRAPH][ZOOM]STAT**.

- K. Press [**Y=**]
- L. Move your cursor to Y2.
- M. Press [**VARs**] [**5**] Statistics
- N. Press [**Right Arrow**] twice, highlight EQ then press [**1**] or [**ENTER**]
- O. Press [**GRAPH**]
 - 1) On what day will the price of COOL be equal to WEST? at the end of day 9
 - 2) Which stock should he buy? Why? COOL because it is trending up
 - 3) What will be the value of West in January of the next year? \$15.50

Name _____

Date _____

Performance Assessment—What's the Point?

A. Solve the systems of equations using the graphing calculator.

$$\begin{aligned} 1. \quad &4x + y = 1 \\ &x - 2y = 16 \end{aligned}$$

$$\begin{aligned} 2. \quad &5x - 9y = 7 \\ &7y - 3x = -5 \end{aligned}$$

Answer = _____

Answer = _____

B. Complete the time series using the table below.

Olympic Winners of the 100m Dash

Year	Converted year Year-28 (L1)	Male Winners	Times (L2)	Female Winners	Times (L3)
1928	0	Percy Williams	10.80 s	Elizabeth Robinson	12.20 s
1932	4	Eddie Tolan	10.30 s	S. Walasiewicz	11.90 s
1936	8	Jessie Owens	10.30 s	Helen Stephens	11.50 s
1948	20	Harrison Dillard	10.30 s	F. Blanker-Koen	11.90 s
1952	24	Lindy Remington	10.40 s	Marjorie Jackson	11.50 s
1956		Bobby Morrow	10.50 s	Betty Cuthbert	11.50 s
1960		Armin Hary	10.20 s	Wilma Rudolf	11.00 s
1964		Robert Hayes	10.00 s	Wyomia Tyus	11.40 s
1968		James Hines	9.90 s	Wyomia Tyus	11.00 s
1972		Valery Borzov	10.14 s	Renate Stecher	11.07 s
1976		Hasely Crawford	10.06 s	Annegret Richter	11.01 s
1980		Allan Wells	10.25 s	Lyudmila Kondratyeva	11.06 s
1984		Carl Lewis	9.99 s	Evelyn Ashford	10.97 s
1988		Carl Lewis	9.92 s	Florence Griffith-Joyner	10.54 s
1992		Linford Christie	9.96 s	Gail Devers	10.82 s
1996		Donovan Bailey	9.84 s	Gail Devers	10.94 s

- Input the data lists as indicated.
- Create a scatter plot using L1 and L2.
- Create a scatter plot using L1 and L3.
- Graph using Zoom Stat.
- Draw the lines of regression for each plot.
- Zoom out from previous graph.

1. Write the equation of the trend line for the male times to four decimal places.

2. Write the equation of the trend line for the female times to four decimal places.

3. What type of correlation do these lines of regression represent? *Circle one.*

A. Positive B. Negative C. Intersected D. Non-Intersected

4. Will women ever be able to beat men in the 100m dash? Justify your answer mathematically.

Name KEY

Date _____

Performance Assessment—What's the Point?

A. Solve the systems of equations using the graphing calculator.

$$\begin{aligned} 1. \quad & 4x + y = 1 \\ & x - 2y = 16 \end{aligned}$$

$$\begin{aligned} 2. \quad & 5x - 9y = 7 \\ & 7y - 3x = -5 \end{aligned}$$

Answer = (2, -7)Answer = (1/2, -1/2)

B. Complete the time series using the table below.

Olympic Winners of the 100m Dash

Year	Converted year <i>Year-28 (L1)</i>	Male Winners	Times (L2)	Female Winners	Times (L3)
1928	0	Percy Williams	10.80 s	Elizabeth Robinson	12.20 s
1932	4	Eddie Tolan	10.30 s	S. Walasiewicz	11.90 s
1936	8	Jessie Owens	10.30 s	Helen Stephens	11.50 s
1948	20	Harrison Dillard	10.30 s	F. Blanker-Koen	11.90 s
1952	24	Lindy Remington	10.40 s	Marjorie Jackson	11.50 s
1956	28	Bobby Morrow	10.50 s	Betty Cuthbert	11.50 s
1960	32	Armin Hary	10.20 s	Wilma Rudolf	11.00 s
1964	36	Robert Hayes	10.00 s	Wyomia Tyus	11.40 s
1968	40	James Hines	9.90 s	Wyomia Tyus	11.00 s
1972	44	Valery Borzov	10.14 s	Renate Stecher	11.07 s
1976	48	Hasely Crawford	10.06 s	Annegret Richter	11.01 s
1980	52	Allan Wells	10.25 s	Lyudmila Kondratyeva	11.06 s
1984	56	Carl Lewis	9.99 s	Evelyn Ashford	10.97 s
1988	60	Carl Lewis	9.92 s	Florence Griffith-Joyner	10.54 s
1992	64	Linford Christie	9.96 s	Gail Devers	10.82 s
1996	68	Donovan Bailey	9.84 s	Gail Devers	10.94 s

- Input the data lists as indicated.
- Create a scatter plot using L1 and L2.
- Create a scatter plot using L1 and L3.
- Graph using Zoom Stat.
- Draw the lines of regression for each plot.
- Zoom out from previous graph.

1. Write the equation of the trend line for the male times to four decimal places.
.0096X + 10.5283
2. Write the equation of the trend line for the female times to four decimal places.
.0189X + 11.9601
3. What type of correlation do these lines of regression represent? *Circle one.*
A. Positive **B. Negative** C. Intersected D. Non-Intersected
4. Will women ever be able to beat men in the 100m dash? Justify your answer mathematically.

Exemplary response: In the year 2081, 153 years after 1928, women and men should both be running the 100m dash in 9.06s according to the intersection of the lines of regression from the data above. After that point, women should be running the 100 m dash faster than men.

Assessment

Scoring Guide

Each question in Part A and Part B will be worth 1 point except for Part B #4 which will have the following rubric:

4	Identifies the point of intersection, year 2081, time 9.065 sec., uses mathematical terms
3	Identifies the point of intersection with 153 years and times as 9.065 sec.
2	Identifies one of the variables, year or time, by number
1	Makes a decision with no mathematical support
0	No response
